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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for SPECIFIC OPTICAL DENSITY OF SMOKE GENERATED BY SOLID MATERIALS FOR AEROSPACE APPLICATIONS¹

This standard is issued under the fixed designation F 814; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers determination of the specific optical density of smoke generated by solid aerospace materials and assemblies, including insulated wire, in thicknesses up to 1 in. (25.4 mm) for flat specimens except for thermoplastic foams which shall be restricted to a maximum thickness of 0.5 in. (12.7 mm), and up to 1/4 in. (6.35 mm) in diameter for insulated wire specimens. Measurement is made of the attenuation of a light beam by smoke (suspended solid and liquid particles) accumulating within a closed chamber, due to nonflaming pyrolytic decomposition and flaming combustion. Results are expressed in terms of specific optical density which is derived from a geometric factor and the measured optical density, a measurement characteristic of the concentration of smoke.

1.2 This test method although based upon and similar in most respects to Test Method E 662, intended primarily for building construction, equipment and furnishing materials, and assemblies, does differ from Test Method E 662 in procedures and apparatus, as specifically required for aerospace applications.

1.3 *This standard should be used to measure and describe the properties of material, products, and assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

1.4 The values stated in inch-pound units are to be regarded as the standard.

1.5 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Applicable Documents

2.1 ASTM Standards:

C 220 Specification for Flat Asbestos Cement Sheets²

D 2843 Test Method for Density of Smoke from the Burning or Decomposition of Plastics³

E 662 Test Method for Specific Optical Density of Smoke Generated by Solid Materials⁴

3. Significance and Use

3.1 This test method provides a means for determining the specific optical density of the smoke generated by specimens of aerospace materials and assemblies including insulated wire under the specified exposure conditions. Values determined by this test are specific to the specimen or assembly in the form and thickness tested and are not to be considered inherent fundamental properties of the material tested. Thus, closely repeatable or reproducible experimental results should not be expected from tests of a given material when specimen thickness, density, wire

¹ This test method is under the jurisdiction of ASTM Committee F-7 on Aerospace Industry Methods and is the direct responsibility of Subcommittee F07.06 on Flammability.

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² Annual Book of ASTM Standards, Vol 04.05.

³ Annual Book of ASTM Standards, Vol 08.02.

⁴ Annual Book of ASTM Standards, Vol 04.07.